

ENVIRONMENT COMMITTEE

TO: MAYOR AND COUNCILLORS

SUBJECT: ELECTRIC VEHICLE (EV) CHARGING REQUIREMENTS FOR NEW NON-RESIDENTIAL DEVELOPMENTS

RECOMMENDATION:

THAT the proposed EV requirements for new non-residential developments, as outlined in Section 4.1 and Attachment 5 of the report titled “Electric Vehicle (EV) Charging Requirements for New Non-Residential Developments” dated October 18, 2023, be received; and

THAT staff be authorized to engage with interested parties on the proposed EV requirements for new non-residential developments, as outlined in Section 4.1 and Attachment 5 of the report.

REPORT

The Environment Committee, at its meeting held on October 18, 2023, received and adopted the attached report seeking Council endorsement to engage with interested parties on the proposed requirements for EV charging for new non-residential developments.

On behalf of the Environment
Committee,

Councillor J. Keithley
Chair

Councillor M. Santiago
Vice Chair

TO: ENVIRONMENT COMMITTEE (EC)
FROM: GENERAL MANAGER PLANNING AND DEVELOPMENT
SUBJECT: **ELECTRIC VEHICLE (EV) CHARGING REQUIREMENTS FOR NEW NON-RESIDENTIAL DEVELOPMENTS**
PURPOSE: To seek Committee and Council endorsement to engage with interested parties on the proposed requirements for EV charging for new non-residential developments.

RECOMMENDATIONS

THAT the proposed EV requirements for new non-residential developments, as outlined in Section 4.1 and Attachment 5 of the report titled “Electric Vehicle (EV) Charging Requirements for New Non-Residential Developments” dated October 18, 2023, be received; and

THAT staff be authorized to engage with interested parties on the proposed EV requirements for new non-residential developments, as outlined in Section 4.1 and Attachment 5 of the report.

1.0 POLICY SECTION

On July 6, 2020, Council adopted the Climate Action Framework authorizing staff to develop EV charging requirements for new non-residential developments. EV Ready¹ requirements will move the City towards the ambitious carbon reduction commitments of the climate emergency declaration and the goal of carbon neutrality by 2050.

EV Ready requirements for new non-residential developments supports the following City strategic, environmental, and climate directions:

- *Environmental Sustainability Strategy* (2016).
- *Community Energy and Emissions Plan* (2016) Move – Transportation for electric vehicle charging infrastructure.
- *Climate Action Framework* (2020) Big Move 5: Zero Emission (ZE) Vehicles.
- *Connecting Burnaby – Transportation Plan* (2021), Green Mobility to support the transition to zero-emission vehicles.
- *Corporate Strategic Plan* (2022) goals and sub goals of a Connected Community, and Inclusive Community, a Healthy Community and a Dynamic Community.

¹ EV Ready means ready to charge (provision of an energized outlet) an electric vehicle (EV) when a charging station is installed.

2.0 BACKGROUND

On November 6, 2017, Council approved the report titled “*Development of Electric Vehicle Policy*” that set the stage for municipal support in the transition of internal combustion engine (ICE) to electric powered vehicles.

In 2018, Council adopted amendments to the City’s Zoning Bylaw – Off Street Parking, to require 100% of parking stalls in new residential developments to be EV Ready.

On October 3, 2022, Council passed a motion directing staff to explore EV requirements for new non-residential developments (e.g. commercial, industrial, etc.).

The purpose of this report is to provide an overview of current local government EV development policies and best practices for non-residential developments, EV adoption trends, current and projected access to charging; and to request that the Committee recommend Council’s endorsement to engage with interested parties on the proposed EV Ready recommendations as outlined in Section 4.1 of this report.

3.0 GENERAL INFORMATION

Almost half of Burnaby’s community-wide carbon emissions come from transportation (Attachment 1 – Figure 1). Reducing these emissions is a key priority for the City, and will be achieved through an accelerated mode shift to public transit and active modes of transportation, such as walking or cycling/rolling, as well as the transition to zero-emission vehicles.

Burnaby’s Climate Action Framework recognizes the magnitude of the carbon emissions from our transportation system, and the need to shift away from personal passenger vehicles to active transportation and public transit through Big Move 4: Accelerated Mode Shift. However, it is recognized that personal passenger vehicles will continue to play a part in our transportation system. Big Move 5: Zero-Emission Vehicles (ZEV) complements Big Move 4 to transition away from internal combustion vehicles to zero-emission vehicles. Together, both actions will directly reduce community emissions and could account for 28% of emission reductions by 2050 (Attachment 1 – Figure 2).

3.1 EV Adoption Trends

Consistent growth in EV adoption can be attributed to a number of forces. Local, provincial and federal levels of government have introduced policies and programs to rapidly transition light-duty vehicles from gas to electric, driving up demand for access to reliable charging. This includes EV Ready requirements for new developments, zero-emission vehicle (ZEV) sales requirements, and provision of electric vehicle infrastructure incentives.

In 2019, the Government of Canada committed to a mandatory 100% zero-emission vehicle sales target by 2040 for all light-duty vehicles, with interim targets of 10% by 2025 and 60% by 2030. With the release of the Federal *2030 Emissions Reduction Plan*

in 2022, ZE vehicles sales targets were amended to be: 100% ZE sales by 2035, with interim targets of 20% by 2026 and 60% by 2030.

In 2019, the Province, under the *ZEV Act*, mandated that all new light-duty vehicles sold in British Columbia (BC) be zero-emission by 2040. Stringency of the *ZEV Act* increased with the release of *Roadmap to 2030* in December 2021, whereby the Province mandated 100% of all light-duty cars and trucks sold in BC be ZEV by 2035, with interim targets set at 26% by 2026 and 90% by 2030.

BC is leading on EV market penetration in Canada, with EVs accounting for 18.1% of new car sales as of 2022 (a 92% increase since 2017). This market share is projected to grow an additional 6.5% in 2023, and by 2026 EVs in BC could make up a quarter of all EVs in Canada². A survey conducted on behalf of BC Hydro in April 2022 found 34% of BC residents considered purchasing an EV as their next vehicle. For the Lower Mainland, this was slightly higher, at 38%².

Over the past three years, EV adoption in Burnaby has grown by 42% for hybrid vehicles (including Plug-In Hybrid Electric Vehicles (PHEV)) and by 98% for electric vehicles³. As of 2022, hybrid vehicles account for 6.3% of registered personal vehicles in the City, with EVs accounting for 3.7%³. The highest concentration of EV ownership is found within Town Centres and Urban Villages where access to charging has increased alongside new development.

3.2 Charging Infrastructure Demand

Reliable access to charging is a key barrier in making the switch to an EV³. At-home charging provides the greatest influence on purchasing an EV (Attachment 2 – Figure 3)⁴ since it is most convenient, and vehicles can be charged overnight. The role of workplace charging provides the next level of influence, followed by public charging stations.

For residents without access to home charging, the ability to charge at work is the next best option. In the Metro Vancouver region, based on anticipated growth in EV adoption and the building stock becoming increasingly able to support EV charging with the introduction of residential EV Ready requirements and EV Ready retrofits, it is projected that approximately 36% of residents will require workplace charging in the future (Attachment 2 – Figure 4)⁵.

The ability to charge quickly in safe and convenient locations through the public charging network also has, and will continue to have, an important role. Demand for

² BC Hydro EV Market Report (2022)

³ ICBC registered vehicles by type within the City of Burnaby (June 2023)

⁴ The EV Charging Pyramid showing the role of charging. (Source: Argonne National Laboratory (2014) as presented in the City of Richmond and BC Hydro's *Residential Guide to Vehicle Charging for Local Governments* (2018)).

⁵ Brenden McEwan and AES Engineering. "EV Ready" Requirements for New Buildings: A Best Practice Guide for BC Local Governments. Prepared for BC Hydro (2021)

public charging is lower than home or workplace charging. However, public charging stations play an important role for the occasional user who may need a “top up” and it is a necessity for those who do not have access to home or workplace charging stations.

4.0 REGIONAL EV READY REQUIREMENTS

A review of Metro Vancouver municipalities found seven local governments in the region have EV Ready requirements for new non-residential developments, and one (the City of Richmond) in the process of implementing new requirements. Details of the breakdown of EV Ready requirements for new non-residential properties by these municipalities can be found in Attachment 3. The recommended charging level for non-residential developments is Level 2⁶, with or without Electric Vehicle Energy Management System (EVEMS), and in some cases, Direct Current Fast Charging (DCFC).

The City of North Vancouver and the City of Vancouver have set a best practice bar with a requirement that 45% of non-residential parking stalls be EV Ready at Level 2 charging. The City of North Vancouver further specifies that this 45% requirement is broken down to a 35% requirement for workplace parking and a 10% requirement for visitor parking. For City of Vancouver, the 45% EV Ready parking stalls require a 5% minimum EV Ready for visitor parking. Once adopted, the City of Richmond's requirements will be in line with both the City of North Vancouver and the City of Vancouver.

The EV Ready requirements in the other 5 municipalities range from 10% (New Westminster) to 20% (District of North Vancouver, City of Port Moody, City of Delta and City of Surrey). Some municipalities have further specific requirements for accessibility parking (between 45-100% EV Ready) and car share parking (100% EV Ready for City of Vancouver).

4.1 EV Ready Recommendations for New Non-Residential Developments

The following policy objectives guided Burnaby's proposed policy approach for EV Ready requirements for new non-residential developments:

- Increase access to workplace and opportunity (public) charging;
- Create equity in access to charging;
- Support expansion and transition of vehicle-share fleets to electric, enabling a shift away from personal vehicle ownership;
- Minimize costs (construction and occupant);

⁶ Level 2 EV Charging level is defined by Society of Automotive Engineers (SAE) International's J1772 standard that consists of 208V to 240V AC, ranging from 16A to 80A maximum for continuous current.

- Simple to review and enforce;
- Support expansion of public charging network; and
- Future-proof buildings for alternate use of electrical infrastructure as personal vehicle ownership declines.

Non-residential building requirements will apply to all non-residential zoning districts, including commercial, industrial, and institutional districts.

The research that underpins these recommendations shows that the emerging policy direction is leaning towards 35% to 50% of new non-residential parking stalls be EV Ready. Leading local governments have already implemented these requirements, with others in the process of implementing or amending their current requirements.

The “EV Ready” Requirements for New Buildings: A Best Practice Guide for BC Local Governments⁷ recommends providing between 25% to 40% workplace parking and 10% to 15% visitor parking be EV Ready for Level 2 charging. This work builds on a more detailed study carried out for the City of North Vancouver and the EV Peer Network of Local Governments in 2020⁸, which compared six configurations of EV Ready parking requirements for new non-residential buildings based on cost and a series of values and objectives (Attachment 4). In this study, a configuration (C5) of 40% workplace parking and 15% visitor parking to be EV Ready for Level 2 charging (not DCFC) achieved a high rating for meeting most of the values and objectives specified above for Burnaby, including minimizing occupant and construction cost, and provides support for the proposed EV Ready requirements.

As EV adoption continues to grow, as BC moves towards a future where almost all passenger vehicles are zero-emission, and with the predicted gap in at-home charging, there will be increased demand for workplace charging. With that, staff recommend the following EV Ready requirements for new non-residential developments (Attachment 5):

- a minimum of 45% parking spaces provided for non-residential uses be EV Ready as follows:
 - 10% of parking spaces are EV Ready for opportunity charging (Level 2 on dedicated circuits);
 - 35% of parking spaces are EV Ready for workplace charging (Level 2 with EVEMS);

⁷ Brenden McEwan and AES Engineering. “EV Ready” Requirements for New Buildings: A Best Practice Guide for BC Local Governments. Prepared for BC Hydro (2021)

⁸ AES Engineering. 2020. *Electric Vehicle Charging Infrastructure Requirements for Non-Residential Buildings*. Prepared for City of North Vancouver.

- 100% of accessible parking spaces are EV Ready (Level 2 charging with or without EVEMS); and
- 100% shared vehicle⁹ parking spaces are EV Ready, with at least one stall to be equipped with Electric Vehicle Supply Equipment (EVSE)¹⁰ (Level 2 charging).

Staff recommend that the Committee forward this report for Council's endorsement and that staff commence engagement with interested parties on the proposed EV Ready recommendations for new non-residential developments.

5.0 COMMUNICATION AND COMMUNITY ENGAGEMENT

Engagement on the development of EV Ready requirements for new non-residential developments in Burnaby has been conducted through a variety of avenues including:

- an email survey during the engagement process with interested parties on the development of the residential EV Ready requirements;
- the development of the *Environmental Sustainability Strategy* and the *Community Energy and Emissions Plan*, producing recommendations to consider developing policy to strategically support and encourage the use of electric vehicles; and
- through discussions during the development approval process.

Previous engagement on EV requirements for non-residential developments was general in nature, and staff recommend that engagement be undertaken with interested parties on the draft requirements contained in this report. Upon authorization to engage with interested parties, staff will work with Marketing and Communication to discuss an appropriate engagement and communication plan, which typically includes communication on the proposed recommendations, surveys and meetings with interested parties.

6.0 FINANCIAL CONSIDERATIONS

Not applicable at this stage, staff will approach Council to secure funding if required.

Respectfully submitted,

E.W. Kozak, General Manager Planning and Development

⁹ Shared vehicles are the fleet for car-sharing organizations (eg. Modo, Evo)

¹⁰ Electric Vehicle Supply Equipment (EVSE) is also referred to as "charging equipment"

ATTACHMENTS

- Attachment 1 – Burnaby’s community emissions sources and reduction goals
- Attachment 2 – Charging influence on EV adoption and current charging landscape
- Attachment 3 – Municipal comparison summary of EV Ready Requirements for New Non-Residential Developments
- Attachment 4 – Comparison of EV charging configurations for non-residential parking to meet certain values and objectives
- Attachment 5 – Summary of Proposed EV Ready Requirements for New Non-Residential Developments in Burnaby

REPORT CONTRIBUTORS

This report was prepared by Tracey Tobin & Vincent Wong, Climate Action and Energy Officers, and reviewed by Erica Lay, Manager, Climate Action and Energy, Wendy Tse, Director Community Planning and Lee-Ann Garnett, Deputy General Manager Planning and Development.

Figure 1: Source of Community-Wide Carbon Emissions in the City of Burnaby

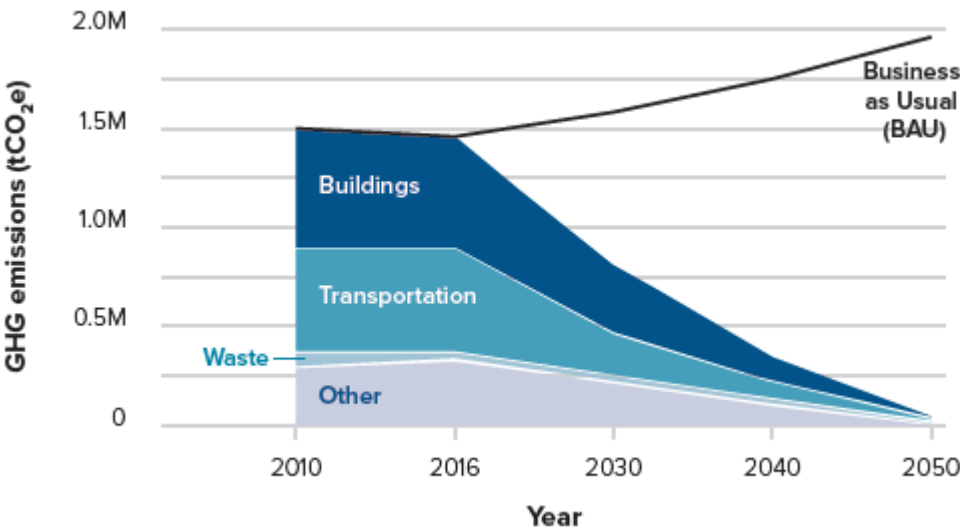


Figure 2: Allocation of Carbon Emission Reductions by Climate Action Framework Big Move, to 2050. Retrieved from Climate Action Framework.

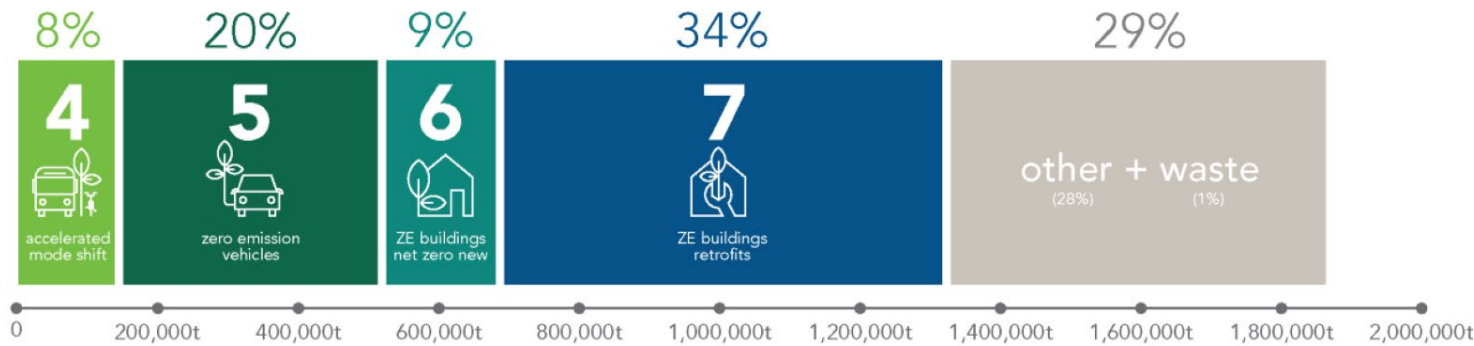


Figure 3: The EV charging pyramid, showing the role of charging influence on EV adoption. (Source: Argonne National Laboratory (2014); City of Richmond and BC Hydro *Residential Guide to Vehicle Charging for Local Governments* (2018)).



Figure 4: Percent of all residents without access to ‘At-Home’ charging in Metro Vancouver (source: AES Consulting report “EV Ready” Requirements for New Buildings 2021).

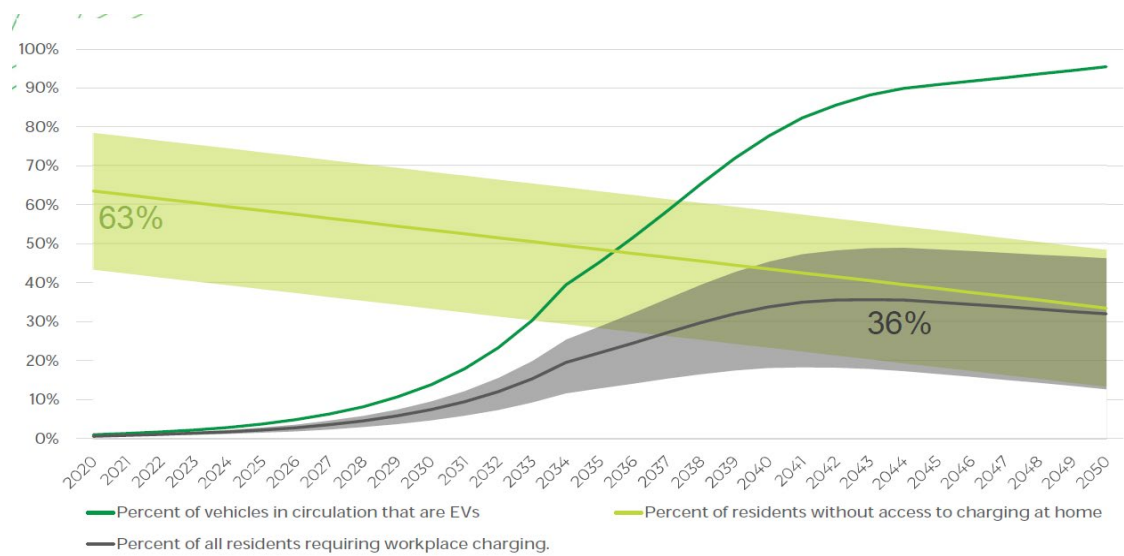


Table 1: Summary of Regional EV Ready Requirements for New Non-Residential Developments

Local Government	Non-Residential - New Development EV Ready Parking Stalls Requirements
City of Richmond (in progress)	<ul style="list-style-type: none"> • 45% (35% workplace; 10% opportunity including accessible parking spaces) • 100% hotel guest parking • 100% shared-vehicle (car-share with at least one Electric Vehicle Supply Equipment installed)
District of North Vancouver	<ul style="list-style-type: none"> • 20% (not including accessible) • 100% accessible parking
City of North Vancouver	<ul style="list-style-type: none"> • 45% (35% workplace; 10% opportunity (visitor)) • 45% accessible parking
City of Port Moody	<ul style="list-style-type: none"> • 20%
City of Delta	<ul style="list-style-type: none"> • 20% commercial • 5% industrial
City of Surrey	<ul style="list-style-type: none"> • 20% commercial; 50% visitor
City of New Westminster	<ul style="list-style-type: none"> • 10% - for commercial buildings with 10 or more parking stalls
City of Vancouver	<ul style="list-style-type: none"> • 45% all non-residential (except hotels & B&Bs) minimum 5% visitor parking • 100% Hotels/B&Bs • 100% shared vehicle (car-share) • 100% accessible (hotels/B&Bs) • 45% accessible all other building uses Level 2

Table 1: Ability of EV Ready non-residential parking configuration to meet common municipal values and objectives. Source: AES Engineering. 2020. Electric Vehicle Charging Infrastructure Requirements for Non-Residential Buildings. Prepared for City of North Vancouver.

Very Strong	5
Strong	4
Adequate	3
Weak	2
Poor	1

		Workplace		Visitor			Other	
		Support drivers w/out home charging, long-distance commuters & limited range EVs	Use clean, low-cost daytime power	Support opportunity charging	Develop fast-charging network	Support electric car share	Minimize Development Cost	Minimize Occupant Cost
C1	10% Dedicated	2	3	3	1	2	4	4
C2	20% Dedicated	3	4	4	1	2	3	3
C3	10% Workplace, 5% Visitor	2	2	2	1	2	5	4
C4	25% Workplace, 10% Visitor	4	3	3	1	5	4	4
C5	40% Workplace, 15% Visitor, No DCFC	5	4	4	1	5	4	4
C6	40% Workplace, 15% Visitor, With DCFC	5	5	5	5	5	1	1

Attachment 5

Table 1: Summary of Proposed EV Ready Requirements for New Non-Residential Developments in Burnaby

Parking Stall Type	Proposed Requirement	Additional Notes
Opportunity	10% stalls are EV Ready (Level 2 on dedicated circuit)	<ul style="list-style-type: none"> • Supports minimum amount of opportunity charging • Balances costs by allowing most charging to be for workplace
Workplace	35% stalls are EV Ready (with or without Electric Vehicle Energy Management System (EVEMS))	<ul style="list-style-type: none"> • Supports gap in predicted access to at-home charging
Accessible	100% of spaces EV Ready (Level 2 charging with or without EVEMS)	<ul style="list-style-type: none"> • Increases access to charging for transition of accessible vehicles
Vehicle-share	100% stalls EV Ready (Level 2 charging; with at least one stall to be equipped with Electric Vehicle Supply Equipment (EVSE))	<ul style="list-style-type: none"> • Supports expansion and transition of car-sharing fleets to electric • Enables a shift away from personal vehicle ownership